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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/582,230	07/21/2000	Takayoshi Hiraga	0670-248	1846

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EXAMINER

CHANG, AUDREY Y

ART UNIT PAPER NUMBER

2872

DATE MAILED: 03/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/582,230	Applicant(s) HIRAGA ET AL.	
	Examiner Audrey Y. Chang	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2003.
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-24 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) ☐ Claim(s) _____ is/are allowed.
 6) ☒ Claim(s) 20-24 is/are rejected.
 7) ☐ Claim(s) _____ is/are objected to.
 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
 * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on **December 2, 2003** has been entered.
2. This Office Action is also in response to applicant's amendment filed October 31, 2003, which has been entered.
3. By this amendment, the applicant has amended claim 20.
4. Claims 20-24 remain pending in this application.

Claim Objections

5. **Claim 22 is are is objected to because of the following informalities:**

(1). The phrase "a longer axis direction of a far field pattern of said real laser light source" recited in claim 21 appears to be vague, confusing and indefinite since it is not clear what is considered as the *pattern* of the laser light source. Also it is not clear what is considered here as the "*column direction of the hologram patterns*" recited. It is not clear how does this column direction relate to the fringes pattern of the hologram, or what does it mean by "aligning" the column direction with the longer axis direction of the light pattern.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 20, 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Takeda et al (PN. 5,828,643) in view of the patents issued to Katayama (PN. 5,696,750).**

Takeda et al teaches an *optical pickup head apparatus* that is comprised of a *single real laser light source* (11, Figures 1 or 15), a *holographic optical element* (12 or 22) serves as the hologram member for diffracting the light emitted from the light source and an *objective lens* (14) for focusing the light to form a plurality of light spots on a *laser disk* (15) serves as the *recording medium*, (please see Figures 1 and 15). Takeda et al teaches that the holographic optical element (12 or 22) has a plurality of diffraction grating patterns (12A, 12B or 22A, 22B, 22C) such that the light generated from the real light source is diffracted into diffraction orders such that the different diffraction order beams appear to be generated by a *plurality of virtual light sources* (A₊, A₋, B₊, B₋ as in Figure 2, column 4). The laser light source is a semiconductor laser light source.

This reference has met all the limitations of the claims with the exception that it does not teach *explicitly* that the hologram/diffraction grating patterns are designed to correct the aberrations of the optical elements in the optical pickup device. **Claim 20 also has been amended** to include the feature that "the aberration to be caused by the optical elements including an aberrations occurring when the light is diffracted by the hologram member". Katayama teaches an optical head apparatus for different types of disks that comprises a *holographic optical element* (5) *having spherical aberrations* capable of *compensating* for a *sum* of spherical aberrations caused when the outgoing *diffracted* light beams of the holographic optical element is incident on the disk and return therefrom and of spherical aberrations

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caused by the diffracted light beam passes through objective lens and return therefrom so that the diffracted beam focused on the disk is **without aberrations**. The term *compensation* means that the aberrations caused by the holographic optical element is inverse or negative of the sum of the above-mentioned aberrations of the diffracted light, and makes the net aberrations of the diffracted light at disk to be zero, (please see column 4, lines 10-24). In order to make the net aberration of the diffracted light beam at disk to be zero, the compensation must include compensation of the aberration caused by the holographic optical element. Although this reference does not call the aberrations of the holographic optical element, which is essential the aberrations caused by the element when light beam is diffracted by it, "an aberration caused by optical elements" such aberration is nevertheless compensated in the process so that the diffracted light is aberration free at the disk. It would then have been obvious to one skilled in the art to apply the teachings of Katayama to modify the holographic optical element of Tanaka et al for the benefit of making the diffracted light beams at optical disk free from aberrations so that reduces the noise in the optical pickup device.

With regard to claim 22, Takeda et al teaches that the holographic patterns are aligned with the axis of the light pattern of the laser light.

With regard to claim 23, Takeda et al teaches that the holographic optical element (22) may comprise relief grating structure that works as a phase grating, with blazed grooves, (please see column 7, lines 20-25, Figures 16a, 16c, 23a and 23b). In general the intensity of light passes through the holographic optical element that is not used for light spot formation (i.e. the diffracted light with higher diffraction orders) is reduced as compared to the original intensity of the light from the laser light source and as compared to the diffraction light used for light spot formation.

7. **Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over the patents**

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issued to Takeda et al and Katayama as applied to claim 20 above, and further in view of the patent issued to Harris (PN. 5,422,753).

The *optical pickup head apparatus* taught by Takeda et al in combination with the teachings of Katayama as described for claim 20 above have met all the limitations of the claims with the exception that these references do not teach explicitly that the non-diffraction light from the light source via the holographic optical element has a uniform intensity. However it is known in the art that a holographic diffraction grating may be designed to modulate the intensity of light beam. Harris in the same filed of endeavor teaches a *binary diffraction grating having surface relief phase grating structure* such that the *non-diffraction light portion* of the light passes it has a *uniform intensity*, (please see Figure 2A and column 6, lines 1-14 and column 8, lines 17-26). It would then have been obvious to one skilled in the art to modify the holographic optical element of Takeda et al to have a diffraction grating pattern that makes the non-diffracted light having uniform intensity for the benefit of producing light spot with uniform intensity which improves the quality of data recording and reading on the recording medium.

8. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Harris (PN. 5,422,753).

Harris teaches a scanning optical device that is comprised of a *single real laser light source* (12), an *optical section* (18) that serves as the light forming element for forming a light spot on a *recording medium* (22) and a *binary diffractive optical element* (20) for controlling the beam *intensity* of the light on the recording medium, (please see Figure 2, columns 5-6). Harris teaches that the binary diffractive structure has a relief phase grating structure such that it provides a uniform intensity for the non-diffracted light that forms the light spot, (please see column 8).

This reference has met all the limitations of the claims with the exception that it does teach explicitly that the binary diffractive structure is a hologram member. However, by definition a hologram

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member has a diffractive structure and the only difference for this binary diffractive optical structure to be a hologram member or not is if it is made *holographically or not*. But it is well known in the art to make diffractive structure holographically, and the *method* for making the binary diffractive optical structure does not distinguish the function of the binary diffractive structure in controlling the intensity of the light spot. Such modification or difference would therefore have been considered as an obvious matter of design choice to one skilled in the art in choosing a method for making the element and with no patentable distinction or given no patentable weight. Although Harris teaches that the binary diffractive optical element is provided after the light passes through the beam forming optical section, however this function of the diffractive structure for controlling the beam intensity does not change by the order of the arrangement. Such modification is therefore obvious to one skilled in the art since it only involves rearranging parts in the device.

This reference also does not teach explicitly that the device is an optical pickup device. However, this recitation has not been given patentable weight because it has been held that a preamble is denied the effect of limitation where the claim is drawn to a structure and the portion of the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478, (CCPA 1951). In this case the servo beam spot formation is fully disclosed by the Harris reference.

Response to Arguments

9. Applicant's arguments with respect to claims 20-23 have been considered but are moot in view of the new ground(s) of rejection.

10. In response to applicant's argument concerning the cited Harris reference does not teach the hologram member has hologram pattern which provides a uniform intensity of a servo light spot in a whole servo light spot area, the examiner respectfully disagrees. Just as applicant's own admission, Harris "aims to provide uniform intensity for the scanning beam", (remark, page 8 line 18, filed on

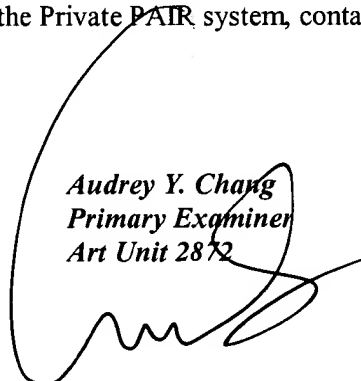
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October 31, 2003), Harris teaches a relief diffraction pattern that **can create uniform intensity of scanning beam** on the **recording medium**, which is a light spot on the recording medium. Whether the resultant uniform light spot is called a servo light spot or not is irrelevant here. Harris shows it is possible to use diffraction pattern to form light spot with uniform intensity which therefore reads on the claims.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Audrey Y. Chang
Primary Examiner
Art Unit 2872

A. Chang, Ph.D.